

## ABSTRACT OF THE DISCLOSURE

Geophysical measurement system employed during the drilling of a well borehole. The system employs a reference clock disposed within equipment at the surface of the earth and a borehole assembly which houses a downhole clock and at least one sensor. The borehole assembly is operationally connected to a drill string, which advances the borehole. At least one synchronization shuttle apparatus containing a shuttle clock is conveyed downhole to the borehole assembly to synchronize the borehole clock with the reference clock. Reference and borehole clock synchronization is maintained at one millisecond or less over a period of days. Outputs from the reference clock and borehole clock and sensor are combined to obtain a measure of a geophysical parameter of interest. Although the measurement system is particularly applicable to seismic-while-drilling measurements, it can be used in a wide variety of clock driven geophysical measurements.